

THE MINERAL INDUSTRY OF ETHIOPIA

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Ethiopia has been a producer of gold, silver, and tantalite and such industrial minerals as brick clay, diatomite, feldspar, gemstones, granite, gypsum and anhydrite, kaolin, limestone, pumice, salt, sand, scoria, soda ash, and talc. The country also produced cement, lime, lignite, and steel (table 1). Ethiopia's main mineral export was gold. Other metal deposits include iron ore, manganese, nickel, and platinum. Other industrial mineral deposits include apatite, bentonite, dolomite, potash, quartz, and sulfur.

In 2004, Ethiopia's GDP amounted to about \$57.8 billion at purchasing power parity. The GDP grew by 11.6% in 2004 after contracting by 3.9% in 2003. Manufacturing accounted for 5% of the GDP in fiscal year 2002-03; construction, 3%; electricity and water, nearly 2%; and mining and quarrying, nearly 1% (International Monetary Fund, 2005a, p. 56; 2005b, p. 208; 2005¹).

Commodity Review

Metals

Columbium (Niobium) and Tantalum.—Ethiopian Mineral Resources Development Enterprise operated the Kenticha open pit columbium (niobium) and tantalum mine near Borena. The company was considering joint ventures with Chinese companies for tantalum exploration (Geda, 2004a). Production of columbite-tantalite amounted to 71 metric tons (t) in 2004 compared with 58 t in 2003 (table 1).

Gold.—The Ethiopian investment company Midroc Gold (a subsidiary of Midroc Ethiopia Group) operated the Lega Dembi gold mine in southern Ethiopia; other gold mines that operated in southern Ethiopia included the Adola and Sakaro. Reported gold production fell to 3,443 kilograms (kg) in 2004 from 3,875 kg in 2003. In fiscal year 2002-03, exports of gold amounted to about 5,000 kg at a value of \$42 million, or 9% of total exports (International Monetary Fund, 2005a, p. 77).

Midroc Gold Mine plc acquired prospecting licenses for the Adola/Lega Dembi and Metekel projects. The company planned to explore for gold and rare-earth elements at the Adola/Lega Dembi prospect, which was north of the Lega Dembi Mine, and for gold at Metekel, which was in western Ethiopia (Gebre-Selassie, 2004). Sheba Exploration (UK) plc explored for gold at its Amora Hill project in 2004.

Industrial Minerals

Cement.—Ethiopia had four cement plants with a combined capacity of nearly 1.52 million metric tons per year (Mt/yr) of cement and 1.36 Mt/yr of clinker. In fiscal year 2003-04, Mughar Cement Enterprise produced 980,000 t of cement compared with about 875,000 t in fiscal year 2002-03. Mughar planned an expansion that would double the company's production. The cost of this project was estimated to be \$115 million (Africa Monitor, 2004; Alemayehu, 2004).

Salt.—Afar Salt plc, Bashenfer Salt plc, and Geo Action plc produced salt at Afdera Lake in northeastern Ethiopia. The companies indicated that the poor condition of the Sodome Meda-Afdera gravel road raised transport costs and forced them to reduce their production in 2004. Repairs completed on the road in September partially alleviated the problem; the Government planned to complete repairs by the end of fiscal year 2004-05. Higher salt production at Lake Afdera was expected to eliminate Ethiopia's dependence upon salt imports (Taye, 2004).

Ethiopian Mineral Development Share Company (EMDSC) and Ezana Co. were engaged in a joint venture to produce salt at Afdera Lake; the companies planned to produce 85,000 metric tons per year (t/yr) of salt in the first phase of the project and increase production to 250,000 t/yr in the second phase. In 2004, EMDSC took over Ezana's share of the project (Geda, 2004b).

Soda Ash.—Abiyata Soda Ash Enterprise produced 6,444 t of soda ash in 2004 compared with 4,377 t in 2003. The company was conducting a feasibility study on the construction of a new processing plant with a capacity of 1.2 Mt/yr. Subject to favorable results of the study, a first-stage plant with a capacity of 220,000 t/yr would be built (Harriman, 2004).

Mineral Fuels

Petroleum.—At the end of 2004, Ethiopia was totally dependent upon imports to meet its demand for petroleum. In fiscal year 2002-03, the value of imported refined petroleum products and other fuels amounted to \$288 million, or about 15% of total imports (International Monetary Fund, 2005a, p. 78). Petronas conducted exploration on Block G in Gambela State and in the Ogaden Basin in 2004.

Infrastructure

The Gilgel Gibe hydroelectric plant was inaugurated in February 2004; the plant had a capacity of 184 megawatts (MW). The Gilgel Gibe II hydroelectric plant was expected to be completed in 2008 at a cost of \$464 million. The European Union and Italy

¹References that include a section mark (§) are found in the Internet References Cited section.

would provide most of the funds for the new plant. Gilgel Gibe II would have a capacity of 450 MW. The China Water Resources and Hydropower Construction Group (Sinohydro) planned to complete the 225-MW Tekeze Dam by 2007. In late 2004, Sinohydro requested a one-year extension on the project. The Gilgel Gibe II and Tekeze plants could double Ethiopia's power generating capacity (Africa Energy Intelligence, 2004; Gebre-Selassie, 2004).

In fiscal year 2003-04, Ethiopia produced 2,311 gigawatthours (GWh) of electricity compared with 2,048 GWh in fiscal year 2002-03. Hydroelectric sources accounted for 98% of the power generated. Most of the country's electricity was produced by the state-owned Ethiopian Electric Power Corp. (National Bank of Ethiopia, 2004§).

At the end of 2003, Ethiopia's transportation network comprised nearly 34,000 km of roads; the Ethiopian segment of the Addis Ababa-Djibouti railroad was 781 km. About 98% of the country's imports and exports were routed through Djibouti (World Bank Group, 2004, p. 1).

Outlook

According to predictions by the International Monetary Fund (2005b, p. 208), the GDP could rise by 5.7% in 2005 and 4.6% in 2006. The outlook for columbium (niobium), gold, and tantalum depend primarily on world market conditions; the outlook for such construction materials as brick clay, cement, limestone, and sand and gravel depend upon the strength of the domestic economy.

References Cited

- Africa Energy Intelligence, 2004, Ethiopia—Chinese fail to keep word: Africa Energy Intelligence, no. 382, December 1-14, p. 6.
- Africa Monitor, 2004, Mugher secures record high profit: Africa Monitor, August 17, p. B1.
- Alemayehu, Hayal, 2004, Mugher reaps own record high profit: Daily Monitor [Addis Ababa, Ethiopia], June 22, 1 p.
- Gebre-Selassie, Wondemagegnehu, 2004, Ethiopia, *in* Mining annual review 2004: London, United Kingdom, Mining Journal Ltd. CD-ROM.
- Geda, Tamiru, 2004a, China eyes mineral exploration in Ethiopia: Capital Ethiopia, April 27, 1 p.
- Geda, Tamiru, 2004b, Ezana loses share in salt industry: Capital Ethiopia, January 6, 1 p.
- Harriman, Stephen, 2004, Soda ash, *in* Mining annual review 2004: London, United Kingdom, Mining Journal Ltd. CD-ROM.
- International Monetary Fund, 2005a, The Federal Democratic Republic of Ethiopia—Selected issues and statistical appendix: Washington, DC, International Monetary Fund, January 28, 87 p.
- International Monetary Fund, 2005b, World economic outlook—Globalization and external imbalances: Washington, DC, International Monetary Fund, April, 289 p.
- Taye, Dawit, 2004, Road for Afdera salt companies: Addis Fortune [Addis Ababa, Ethiopia], December 5, 2 p.
- World Bank Group, 2004, Ethiopia—Road sector development Phase II project: Washington, DC, World Bank Group, Report no. 29877-ET, 68 p.

Internet References Cited

- International Monetary Fund, 2005 (April), Ethiopia, World Economic Outlook Database, accessed July 15, 2005, via URL <http://www.imf.org/external/pubs/ft/weo/2005/01/data/index.htm>.
- National Bank of Ethiopia, 2004, Energy production—Annual report 2003/2004, accessed July 20, 2005, via URL http://www.nbe.gov.et/NBEPublications/Annualnew_Index.htm.

TABLE 1
ETHIOPIA: PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Commodity ³		2000	2001 ^e	2002 ^e	2003 ^e	2004 ^e
Cement, hydraulic		879,962	900,000 ⁴	900,000 ⁴	1,200,000	1,300,000
Clays: ⁵						
Brick		224,093	200,000 ^r	170,000 ^r	140,000 ^r	106,609 ⁴
Kaolin, China clay		1,654	1,800	3,534 ^{r,4}	3,088 ^{r,4}	4,250 ⁴
Other clay	cubic meters	23,000 ^e	25,000	27,000 ^r	28,000 ^r	28,000
Columbite-tantalite, ore and concentrate:						
Gross weight	kilograms	64,940	46,900 ^{r,4}	55,000 ^{r,4}	58,000 ^{r,4}	71,000 ⁴
Nb content	do.	6,490	4,700 ^r	5,500 ^r	5,800 ^r	7,100
Ta content	do.	38,800	28,000 ^r	33,000 ^r	35,000 ^r	42,000
Diatomite		140 ^e	1,500	1,600 ^r	1,700 ^r	1,700
Feldspar		285	310	340 ^r	350 ^r	461 ^{4,5}
Gold, mine output, Au content	kilograms	3,206 ^r	3,862 ^{r,4}	3,670 ^{r,4}	3,875 ^{r,4}	3,443 ⁴
Gypsum and anhydrite, crude		46,798	50,500 ^{r,4}	22,500 ^{r,4}	48,058 ^{r,4}	51,200 ⁴
Lime		3,769	4,100 ^r	4,500 ^r	4,600 ^r	4,600
Pumice ⁵		156,466	180,000 ^r	210,000 ^r	240,000 ^r	270,994 ⁴
Salt, rock		56,400	90,000 ^r	120,000 ^r	150,000 ^r	140,000
Scoria ^e		287,000	310,000	340,000 ^r	350,000 ^r	350,000
Silver, mine output, Au content	kilograms	1,018	3,545 ^{r,4}	900 ^{r,4}	999 ⁴	1,133 ⁴
Soda ash, natural		3,805	7,543 ⁴	3,843 ^{r,4}	4,377 ^{r,4}	6,444 ⁴
Stone, sand and gravel: ⁶						
Construction stone, crushed	thousand metric tons	3,459	3,800 ^r	4,100 ^r	4,300 ^r	4,300
Dolomite		NA	NA	NA	NA	1,248 ⁴
Granite		140	150	170 ^r	170 ^r	170
Limestone	thousand metric tons	1,197	1,100 ^r	1,100 ^r	1,000 ^r	915 ⁴
Marble		6,662	7,200	7,900	8,100	8,100
Sand ⁷	thousand metric tons	1,853	2,000	2,200 ^r	2,300 ^r	2,300
Sandstone	do.	NA	NA	NA	NA	1,221 ⁴
Silica sand		5,601	6,000	6,000	6,000	6,000
Other stone		15,768	17,000	19,000 ^r	19,000 ^r	19,000

^eEstimated; estimated data are rounded to no more than three significant digits. ^rRevised. NA Not available.

¹Includes data available through October 31, 2005.

²Data are for year ending July 7 of the year listed.

³In addition to the commodities listed, some lignite, semiprecious gemstones, crude and semimanufactured steel, sulfuric acid, and talc reportedly were produced, and platinum was reportedly contained in gold ingots from the Lega Dembi Mine, but information is inadequate to estimate output.

⁴Reported figure.

⁵Includes quartz.

⁶When reported as volume or pieces, conversions to metric tons are estimated.

⁷May include gravel.

TABLE 2
ETHIOPIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2004

(Metric tons unless otherwise specified)

Commodity		Major operating companies	Location of main facilities	Annual capacity
Caustic soda		Abiyata Soda Ash Enterprise (Government-owned)	Plant at Ziway	10,000.
Cement		Messebo Building Materials Production Share Co. (Government-owned)	Plant at Mekele	640,000 cement; 600,000 clinker.
Do.		Mugher Cement Enterprise (Government-owned)	Plant at Mugher	720,000 cement; 620,000 clinker.
Do.		do.	Plant at Addis Ababa	125,000 cement; 112,000 clinker.
Do.		do.	Plant at Dire Dawa	32,000 cement; 24,000 clinker.
Columbium (niobium) and tantalum	kilograms	Ethiopian Mineral Resources Development Enterprise (Government-owned)	Kenticha Mine near Borena	112,000 tantalum. ^c
Glass		Addis Ababa Bottle and Glass Share Company	Plant at Addis Ababa	8,000.
Gold		Midroc Gold (subsidiary of Midroc Ethiopia Group)	Mine at Lega Dembi	1,500,000 ore processing.
Do.	kilograms	do.	do.	4,000 gold.
Kaolin		Ethiopian Mineral Resources Development Enterprise	Mine at Bamba Wuha	15,000.
Marble		Ethiopian Marble Industries	Mines at Harar and various sites in western Ethiopia	NA.
Do.		National Mining Corp. (subsidiary of Midroc Ethiopia Ltd.)	Mine at Mugher	NA.
Do.		Saba Stones	Mine in Tigre Province	NA.
Salt		Afar Salt plc, Bashenfer Salt plc, and Geo Action plc	Mines at Afdera Lake	NA.
Soda ash		Abiyata Soda Ash Enterprise	Mine at Lake Abiyata	20,000. ^c
Steel:				
Crude		Ethiopia Iron and Steel Factory	Plant at Akaki	NA.
Semimanufactured		do.	do.	12,000.
Do.		Zuquala Steel Rolling Mill Enterprise (Government-owned)	Plant at Debre Zeit	100,000.
Galvanized		Akaki Metal Products Factory	Plant at Akaki	NA.
Sulfuric acid		Melkasa Aluminum Sulfate and Sulfuric Acid Factory	Plant at Melkasa	NA.

^cEstimated. NA Not available.

TABLE 3
ETHIOPIA: MINERAL RESOURCES IN 2004¹

Commodity	Deposit	Tonnage	Grade	Mineral content
Diatomite	Lakes Region, Shewa and Arsi Provinces	NA	NA	85 Mt.
Dolomite	Galleti	NA	NA	1.4 Mt.
Do.	Hula-Kuni	NA	NA	250,000 t.
Feldspar	Kenticha	1.14 Mt	40% feldspar	500,000 t.
Do.	Babile-Bombas	0.3 Mt	50% feldspar	150,000 t.
Gold	Lega Dembi	NA	NA	83,000 kg.
Do.	Adola	NA	NA	4,500 kg.
Gypsum	Sodoble	NA	NA	56 Mt.
Do.	Adigudom	NA	NA	400,000 t.
Kaolin	Bombowha	1 Mt	30% kaolin	300,000 t.
Do.	Kombelcha	0.96 Mt	31% kaolin	300,000 t.
Limestone	Mossobo	NA	NA	69.5 Mt.
Do.	Mugher	NA	NA	50 Mt.
Do.	Dire Dawa	NA	NA	46 Mt.
Marble	Mora	NA	NA	46.5 Mt.
Do.	Baruda	NA	NA	13.6 Mt.
Natural gas	Calub	25 billion cubic meters	NA	NA.
Peridot	Bulgendo	NA	NA	2,457 kg.
Salt	Denkali depression	NA	NA	3,000 Mt.
Do.	Lake Afdera	NA	NA	290 Mt.
Silica sand	Mugher	NA	NA	3.4 Mt.
Soda ash	Lakes Abiyata, Chiltu, and Shala	NA	1.1% to 1.9% Na ₂ CO ₃ ²	460 Mt.
Talc	Anno	NA	NA	120,000 t.

NA Not available.

¹Abbreviations used in this table for units of measurement include the following: kg, kilograms; Mt, million metric tons; and t, metric tons.

²Na₂CO₃, sodium carbonate (soda ash).

Sources: Mengistu, Tabetu, and Fentaw, H.M., 2000, The industrial mineral and rock resource potential of Ethiopia: Chronicle of Mineral Research & Exploration, no. 540, September, p. 33-40; Radler, Marilyn, 2002, Worldwide reserves increase as production holds steady: Oil & Gas Journal, v. 100, no. 52, December 23, p. 113-145; Ethiopia Ministry of Mines, 2002, Opportunities for investment in Ethiopia's industrial minerals: Addis Ababa, Ethiopia, Ethiopia Ministry of Mines, 19 p.; Ethiopia Ministry of Mines, 2002, Opportunities for investment in Ethiopia's gemstones: Addis Ababa, Ethiopia, Ethiopia Ministry of Mines, 8 p.; Mining Journal, 2002, Ethiopia supplement: Mining Journal, v. 338, no. 8689, June 14, 12 p.